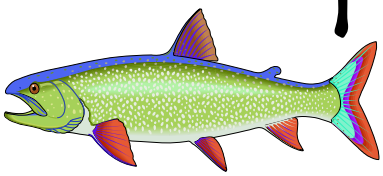
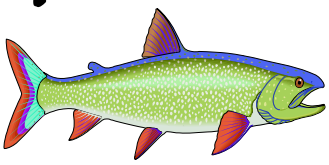
Aquaculture in Utah





December 2006

Utah Department of Agriculture and Food . Division of Animal Industry
350 N. Redwood Rd., Box 146500, SLC, UT 84114 (801) 538-7029
www.ag.utah.gov

DRUGS CURRENTLY AVAILABLE TO TREAT FISH DISEASES

Source: March 2006 Aquaculture Magazine E-newsletter

FDA approved therapeutic drugs are defined as articles intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease. Diseases of aquatic species include bacterial and fungal infections and parasitic infestations. The most common routes of administration in aquaculture are medicated feed and immersion therapy (bath treatment). Antimicrobials (medicated feeds) for use in aquaculture are typically distributed as either Type A medicated articles or Type B or Type C medicated feeds. Medicated feeds for use in aquaculture are made by mixing the approved type A medicated article into 1) concentrated feed to make a Type B medicated feed or 2) finished feed to make a type C medicated feed. Type B medicated feeds are intended for further manufacture into Type C medicated feeds. Type C medicated feeds can be fed directly to animals.

The following is an update and review of drugs currently available for use in aquaculture. FDA approved drugs and treatments include *Florfenicol* (Aquaflor), *Oxytetracycline Quaternary Salt* (Terramycin 100 for fish), *Sul-*

(See DRUGS on page 3)

ARE WE GETTING CLOSER TO ORGANIC AQUACULTURE?

Source includes: Aquaculture Magazine, March 2006 E-newsletter, by George Lockwood

Organic agriculture products are marketed in the U.S. under the Organic Food Production Act of 1990 (OFPA), and rules promulgated under it by the United States Department of Agriculture (USDA) in the "Final Rule." Within the USDA the National Organic Program (NOP) administers this program and the National Organic Standards Board (NOSB) advises. Establishing the Final Rule and amendments to it are the responsibility of the Secretary of Agriculture in a process that involves recommendations from the NOSB and NOP, as well as requiring extensive opportunities for public comments.

Organic aquaculture is the farming of aquatic animals and plants without the use of synthetic fertilizers, pesticides, antibiotics, growth hormones or feed additives. It helps produce a natural food without damage to the environment. It helps produce a product that is safe and secure and free from harmful chemicals and additives. Consumer demands for organically grown products are increasing. Potential organic growers need to document that their fish are free of all

(See ORGANICS on page 4)

EFFECTS OF TEMPERATURE, PHOTOPERIOD, AND *MYXOB0LUS CEREBRALIS* INFECTION ON GROWTH, REPRODUCTION, AND SURVIVAL OF *TUBIFEX TUBIFEX* LINEAGES

Source: The Whirling Disease Initiative Newsletter, Volume 2, Issue 1, January 2006

Researchers Robert DuBey and Colleen Caldwell of the New Mexico Cooperative Fish and Wildlife Research Unit and William Gould of New Mexico State University tested two lineages (III and VI) of *Tubifex tubifex* worms to determine their response to a range of photoperiod and temperatures when infected by *Myxobolus cerebralis.* These lineages (III and IV) are identified by polymerase chain reaction (PCR) and amplification of 16S mtDNA. The *Tubifex tubifex* species was studied from the San Juan River in New Mexico. Researchers have discovered that *Tubifex tubifex,* the alternate host of the whirling disease parasite, includes several genetically distinct lineages. The investigation evaluated the response of two *Tubifex tubifex* lineages to environmental conditions and infection by *Myxobolus cerebralis.*

(See TUBIFEX on page 7)

HATCHERY RELEASED WHIRLING DISEASE INFECTED TROUT

Source: FHS Newsletter, October 2005: http:/ www.fisheries.org/fhs/

A Colorado Division of Wildlife (CDOW) official recently announced that a private fish hatchery released trout infected with whirling disease into rivers in New Mexico, Utah and Colorado. Dwight Babcock, 59, owner of Cannibal Canyon Ranches in Marvel, Colorado, was fined $30,000 after pleading guilty in federal court last week to seven criminal counts of knowingly selling, transporting and stocking wildlife (trout) illegally in New Mexico and Utah, the CDOW reported. As a part of his plea, Babcock acknowledged releasing infected fish from his hatchery into rivers in Colorado at least 125 times between 1997 and 2003, according to CDOW spokesman Joe Lewandowski. The plea followed a two year investigation. Babcock's hatchery first tested positive in 1997, and again in 1998, 1999 and 2002. Babcock will not be allowed to stock fish into Utah and New Mexico waters. He will be allowed to sell fish to restaurants and food retailers in Colorado.

The Utah Department of Agriculture Fish Health Program sampled a small number of trout from a pond in Utah where trout had been stocked from Cannibal Canyon Ranches. The laboratory results were negative for whirling disease.

NON-CHEMICAL CONTROL OF AGAE BLOOMS

Source: Paul Krauth, Utah Department of Environmental Quality, Division of Water Quality

One of the major problem facing managers of water impoundments is the control of algae in the system. The dreaded (and routine) blooms cause issues with both pH and odors. Typical control methods have included chemical treatment. The Utah Division of Water Quality (DWQ) has been experimenting with barley straw as a non-chemical alternative for algae control.

The use of rotting barley straw for algae control was discovered in the 1980s in England Dr. Jonathan Newman at the Centre for Aquatic Plant Management.

Barley straw does not kill existing algae, but it inhibits the new growth of algae. The exact mechanism is poorly understood but it seems that aerobic decaying barley straw, when exposed to sunlight, produces chemicals that inhibit algae growth. One of the chemicals released is hydrogen peroxide. Concentrations of hydrogen peroxide of only 2 ppm appear to inhibit algae growth.

The decomposition rate is temperature dependent. At water temperatures below 50^{o} F it may take 6-8 weeks for straw to react, but only 1-2 weeks when the water is above 68^{o} F.

DWQ has regulatory oversight of all wastewater systems in Utah. One of the most common treatment methods used is the facultative (non-aerated) lagoon. Currently 65% of all municipal wastewater treatments use lagoon systems. Routine violations of permit limits were impetuous for the DWQ investigating this control method.

In 2004 DWQ partnered with Mountain Green Sewer Improvement District in Morgan County, to provide a demonstration site for barley control strategy. Historically Mountain Green wastewater lagoons routinely discharged greater than 45 mg/L of total suspended solids (TSS), and exceeded their discharge permit. Analysis of the TSS shows that most were composed of algae.

In May, DWQ applied barley in the form of a floating boom to the system. The boom, or "barley burrito" as it has been nicked named, is simply snow fencing wrapped around lose pack straw. Floatation was provided by silicon sealed jugs placed approximately 8 feet apart in the "burrito". After placing the boom in the system, weekly TSS samples were taken. The boom was replaced in July using the same construction method. After 16 weeks of testing, weekly sampling was stopped. The plotted data appears to show a dose response relationship. A 29.4% annual reduction of TSS was observed after the testing.

The application rate DWQ is using for wastewater lagoons is 300 pounds per acre. Impoundments that are not as nutrient rich would need less, somewhere in the 175-250 range.

To learn more about the control of algae with barley straw or receive help with barley straw applications please contact Paul Krauth at (801) 538-6018 or e-mail him at krauth@utah.gov.

(Continued)

(DRUGS continued from page 1)

fadimethoxine/Ormetoprim (Romet 30), Formalin, *Chronic gonadotropin* (Chorulon),*Tricaine methanesulfonate* (Finquel and Tricaine), *Oxytetracycline Hydrochloride* (water soluble powder), and *Oxytetracycline Hydrochloride* (OxyMarine, Oxytetracycline hydrochloride Soluble Powder-343, Terramycin-343 Soluble Powder). These applications are listed in order and discussed in this article.

Aquaflor is supplied by Schering-Plough Animal Health as a Type A medicated article for the control of mortality in catfish due to enteric septicemia of catfish associated with *Edwardsiella ictaluri.* The treat regimen for this indication is 10 consecutive days of therapy at a dose of 10 mg per kilogram of body weight. The withdrawal time (time allotted prior to human consumption) is 12 days prior to harvest. Aquaflor is available only on the order of a licensed veterinarian.

Terramycin 100 for Fish is a Type A medicated article manufactured by PHibro Animal al Health Corporation and is available as an over-the-counter (OTC) product approved for treatment of certain bacterial diseases in salmonids, catfish, and lobsters. In salmonids, Terramycin 100 for Fish is approved to control ulcer disease caused by Haemophilius piscium, furunculosis in salmonids caused by Aeromonas salmonicidia, bacterial hemorrhagic septicemia caused by Aeromonas liquefaciens, and pseudomonas disease with a 21-day withdrawal time. In catfish, it is approved to control bacterial hemorrhagic septcemia caused by Aeromonas

(See DRUGS on page 4)

REDUCING THE RISK OF WHIRLING DISEASE IN PONDS

Sources include: The Whirling Disease Initiative Newsletter, Volume 1, Issue 3, September 2005

The introduction of whirling disease to previously uninfected drainages may be pinpointed t**o** the stocking of diseased fish. However, there are several other factors that contribute to the problem. Ponds used for stocking or rearing of trout are vulnerable to the establishment of *Myxobolus cerebralis.* Ponds accumulate nutrients and organic matter which are the perfect substrate for building dense populations of worms, because the water is slow moving over time. The probability of whirling disease establishment in ponds is high if spores are introduced into this environment. Because they are earthen bottom, their substrate has never been successfully decontaminated of whirling disease spores.

Private ponds are especially vulnerable to contagion by *M. cerebralis,* especially if the ponds are constructed where the disease is present in the ecosystem. However, proper construction of a pond can help in the prevention of whirling disease. The use of covered spring or well waters that are known to be specific pathogen free will help the pond owner reduce the possibility of contacting the disease.

To help ensure whirling disease is not contacted, the pond operator or potential fish buyer should take the following steps: 1) request to see the latest inspection report and history of all the inspections from the prospective seller; 2) inquire as to whether the fish to be purchased were actually hatched and reared at the seller's facility or whether they were purchased from another grower; 3) purchase fish only from sources that have a history of inspections with SPF results; 4) verify the pond is licensed for the species of fish intended for placement; 5) ensure that necessary import and transport permits are obtained prior to stocking the pond and 6) follow best management practices. Through the implementation of best management practices the ambient levels of infectivity can be greatly reduced**.** These practices include using site specific gear or disinfecting fishing gear and equipment with at least 10 per cent chlorine bleach between sites and thoroughly washing off your agricultural or recreational vehicles when traveling from WD contaminated areas to your uncontaminated areas.

(Continued)

FEEDING FISH JUST PRIOR TO INSPECTIONS

When UDAF inspectors cut open trout to obtain samples at your hatchery, it is important that little to no food is in their gastrointestinal tracts. Otherwise, there is a greater chance that the food distended in the gastrointestinal tract could be cut, thus exposing ingesta. In this instance the stomach and gut content sample could contaminate the sample and cause a false positive BKD test result. Therefore, we request that you do not feed your fish for 24-48 hours before the fish are sacrificed. Although every precaution is undertaken to prevent cross-contamination, this will help ensure that it does not occur.

(ORGANICS con't from page 1)

additives. Organically grown animals are often more valuable and are sold for top dollar. Organically grown products may be more appealing to environmentally conscious consumers.

Initial work on organic aquaculture rule making began in the US in 1999. Since that time aquaculture committees and task forces have been formed to produce an Interim Final Report (IFR). This IFR is posted on the USDA NOP website at: http://www.ams.usda.gov/nop/Task Forces/AATFInerimFinalReport.pdf. An associated link listed under http://AATFInterimaFinalReportPubComnt.pdf invites public comments to the report. An initial public comment period ended April 10, 2006.

The earliest possible time for the Secretary of Agriculture to adopt proposed amendments to the Final Rule will be sometime around October 2008. The first action of the NOSB was to review the IFR in April of 2006. Based on this review of the IFR the NOSB will decide on their recommendations at their fall 2006 meeting at a place and date yet to be determined. Assuming a favorable recommendation, NOP will publish an official notice of Advance Rule Making in the spring of 2007, with further public comments received through June of 2007. Their proposed rule will be published in October 2007, with additional public comments received through December 2007. The Proposed Rule will then be revised, if necessary, in April, 2008 for amendment into the Final rule in October 2008.

Three public comment periods are scheduled. NOP intends to rely upon the National Organic Aqua-

(See ORGANICS on page 6)

(DRUGS continued from page 3)

liquefaciens and pseudomonas disease with a 21 day withdrawal time.

Romet 30 is a type A medicated article manufactured by PHARMAQ AS. It is approved to control furunculosis in salmonids caused by Aeromonas salmonicidia with a 42-day withdrawal time/ In catfish, Romet 30 is approved for the control of enteric septicemia of catfish caused by Edwardsiella ictaluri with a 3-day withdrawal time. The treatment regimen for both indications is 50 mg per kilogram of body weight for 5 consecutive days. The withdrawal times are also the same, 42 days for salmonids and 3 days for catfish. Mixing instructions are provided with the product.

Formalin is currently approved as an external parasiticide. It is an antiparasitic used in immersion therapy (bath treatment). The three approved formalin products are Parasite-S by Western Chemical, Formalin-F by Natchez Animal Health, and Paracide-F by Argent Chemical Laboratories. Parasite S and Formalin-F are both approved for the control of external protozoa on all finfish, for the control of protozoan parasites on penaeid shrimp, and for the control of monogenetic trematode parasites on all finfish. Parasite-S and Formalin F are both approved for the control pf fungi of the family Saprolegniaceae on all finfish eggs. Paracide-F is approved for control of fungi of the family Saprolegniaceae on salmon, trout and esocid eggs.

Chorulon is an FDA approved production drug. These drugs are

(Continued)

(DRUGS continued)

defined as articles (other than food) intended to affect the structure or any function of the body of an animal. These compounds are used in the management and husbandry of aquatic species. Chorulon is supplied by Intervet Inc. and is indicated to improve spawning in make and female brood finfish. Chorulon is an injectable drug given intramuscularly ventral to the dorsal fin. Depending on the body weight and the dose administered, more than one injection site may be needed in order to prevent injecting an excessively large volume in a single injection site. The dose range of Chorulon in males is 50 to 510I.U. per pound of body weight and in females it is 67 to 1816 I.U. per pound of body weight for one to three injections. No withdrawal period is required for brood fish treated according to label instructions. The total dose administered (all combined injections) should not exceed 25,000I.U. (25ml) per fish in fish intended for human consumption.

Finquel and Tricaine are two products approved for the temporary immobilization (sedation) of aquatic cold-blooded animals, including finfish. Finquel (MS-222) is made by Argent Laboratories and Tricaine-S is manufactured by Western Chemical. Tricaine methanesulfonate is often used to assist in the handling of fish during fish stripping, weighing, measuring, marking, surgical operation and transport. Tricaine methanesulfonate is available in powder form and is mixed in water. Fish may be sedated or anesthetized by immersion at levels ranging from 15 to 330 mg/L depending on the desired depth of sedation/anesthesia.

(See DRUGS on page 5)

(DRUGS continued from page 4)

Tricaine methanesulfonate should not be used within 21 days of harvesting fish and is restricted for the following food fish families: Ictaluridae (catfish), Salmonidae (trout and salmon), Esocidae (pickerels and pikes) and Percidae (perch). It should not be used for food fish only when water temperatures exceed 10 deg. C. (50 deg. F.). In other fish the drug should be limited to hatchery or laboratory use.

OxyMarine (water soluble powder) is used as a bath treatment for the skeletal marking of early life stages (fry and fingerling) of all finfish species. It is provided by PHARMAQ AS. Oxytetracycline hydrochloride Soluble Powder-343 is available from Phoenix scientific and Terramycin-343 Soluble Powder is manufactured by Pfizer. These products are also available over-the–counter. For these compounds the fish are immersed in the water containing a dose ranging from 200 to 700 mg oxytetracycline hydrochloride (buffered)/liter of water for 2 to 6 hours. FDA has determined that a withdrawal time beyond the grow-out period is not needed.

For additional information on the status of drugs approved for use in aquaculture, visit the FDA's Center for Veterinary Medicine Aquaculture Page at: http://www.fda.gov/cvm/aqualibtoc.htm

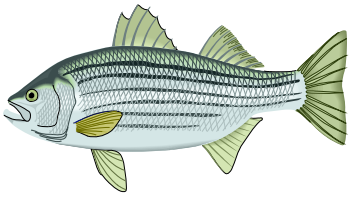
STONES MAKE HATCHERY REARED FISH BRAINS INCREASE IN SIZE

Sources: Undertimes.com News Service, March 8, 2006. http: // www.underwatertimes.com/ news.php, article id.#95437100286 and Journal of Experimental Biology 209, 504-509 (2006), February 2006..

According to a new study by researchers at UC Davis, hatchery reared steelhead trout show increased growth of some parts of the brain when small stones (approximately 4 centimeters in diameter) are scattered on the bottom of their tank. The stones in this study were situated at intervals of approximately one per square centimeter. The brains of those young fish reared with stones were closer in size to those of salmon reared in the wild and expressed behavior closer to wild than to the hatchery reared fish. UC Davis graduate student Rebecca Kihslinger said, "There's an obvious difference between the hatchery and the wild fish. A simple change affected brain growth in a large scale way". She carried out the study with Gabrielle Nevitt, professor of neurobiology, physiology and behavior at UC Davis.
This study, which could affect the design of hatcheries for breeding fish to restock wild populations, is also published is the February 2006 issue of the Journal of Experimental Biology.

Kihslinger reared steelhead in regular tanks and in tanks scattered with small stones. She measured the size of their brains after 10-12 days when the fish were emerging as fry and videotaped the results. Results showed that fish reared in both sets of tanks had brains of similar size. However, the cerebellum (a part of the brain that controls fish movement and body position) was significantly larger in fish reared with stones in the bottom of their tanks. It was also noted that those fish moved around less, perhaps using their yolk reserves more efficiently. The study's conclusion showed that fish reared in the river had larger brains than either group of fish reared in the tanks, but the overall size of the cerebellum was about the same in fish reared in tanks with stones The fish reared in the tanks without stones had smaller cerebellums.

This study suggests that placing a stone substrate in cement raceways may result in trout with increased brain function.



NEW FISH HEALTH PROGRAM SECRETARY

Cindy Coates is the new Fish Health Program secretary. She was previously employed as a case worker at the Department of Corrections. Cindy has been employed by the State of Utah for 3 ½ years. She lived in Wyoming for over 20 years where she worked for Lincoln County School Dist., in Cokeville, WY. Cindy enjoys being with her family, reading, and most sports. She is the mother of two and grandmother of one. Cindy and her husband Jeff reside in Sandy.

NUTRIENT REQUIREMENTS OF FISH UPDATED

Source: National Research Council, March 28, 2006, by Robin Schoen

The National Research Council (NRC), a division of the National Academies in Washington, DC, recently announced plans to update nutrient requirements of fish. Many aspects of fish nutrition have changed since the current report entitled the *Nutrient Requirements of Fish* was published in 1993. Since then questions have arisen regarding supply and demand as to whether supplies of fish meal and fish oil will be adequate to meet future needs. Since 1993 a large amount of new research data on nutrient requirements has been published.

The new NRC report will focus on the most important commercial fish species, such as catfish, tilapia, bass, trout and salmon. Marine shrimp will also be included in the new publication. Analysis of recent research on feeding and nutrition of fish and shrimp, nutrient requirements, and physiological and environmental factors affecting requirements will be in the updated publication. A new set of nutrient requirements will be developed based on this analysis. Topics discussed will include a description of feeding and production methods to reduce waste and environmental impact; a review of the benefits and detriments of including marine products in fish feeds; information on the composition of feeds and feed additives and other compounds routinely fed to fish and shrimp; and data on changes in the nutrient content of fish, such as omega-3 fatty

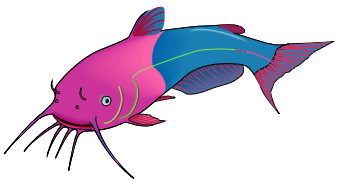
(Continued)

(NUTRIENT con"t)

acids. Changes in fish diet formulation will also be included.

A committee comprised of professionals with expertise in a variety of areas will be sought to prepare the updated report. Members of this committee will be appointed by the NCR. Topics discussed in the publication will include energy nutrition, protein and amino acid nutrition, vitamin and mineral nutrition, nutrient bioavailability, feed composition and feed additives (including medications), diet formulation, practical feeding, nutrient excretion and aquatic ecology computer modeling.

An effort will be made to solicit input and provide opportunities for public comments during the preparation of the report. Input may be obtained through public forums in conjunction with scientific meetings and specific requests for information from interested agencies, organizations and individuals. Researchers, fish industry professionals, regulatory and feed control officials, and consultants will be given the opportunity to provide input on various aspects of nutrition.



(ORGANICS con't from page 4)

culture Working Group (NOAWG) to advise on the public comments received. All public comments will be posted on an appropriate web-site among with NOP responses. It is important that many members of the aquaculture community express their support for the IFR and the standards proposed. The proposed standards and reports should be self explanatory. In the case of fish feed, there are two proposals presented. The first option (Option A) provides for fish meal oil to be processed from wild fish under certain circumstances. The second option (Option B) is presented to eliminate the need for wild fish to be certified organic. This option specifies that fish meal and oil from wild fish that are not organic can be used as "feed additives" or "supplements" to the extent necessary for the animal's health.

Should limitations be placed upon the maximum amount of fish meal and oil allowed as supplements under organic certification, it may be possible to use approved synthetic amino acids. This will require the NOSB and NOP to place such synthetic fish feed supplements on the NOP "National List of Approved and Prohibited Substances." Doing this, however, is a considerable undertaking requiring two years or more, and then, if approved, with mandatory removal in five years from the National list, or renewal.

In preparing its report, the NOAWG compiled an exhaustive list of substances used in aquaculture that may need to be listed in the National List. The NOAWG has yet to sort through

See ORGANICS on page 7

National Aquatic Animal Health Plan (NAAHP)

Source information: http:// www/.aphis.usda.gov/vs/aqua/ naah_plan.html

The National Aquatic Animal Health Task Force on Aquaculture is directed under the Joint Subcommittee on Aquaculture (JSA). The mission of the task force is to develop a national health plan that provides for "efficient, safe, and effective national and international commerce of aquatic animals; protection of cultured and wild aquatic animals from foreign pests and diseases; the US government to meet its legal trade obligations; and, the availability of diagnostic and certification services for public, private, and tribal entities."

In 2001 the JSA directed federal agencies with the responsibility to manage aquatic animal health and develop a NAAHP. The federal agencies are Agriculture-APHIS, Interior-Fish & Wildlife Service, and Commerce-NOAA Fisheries. Stakeholders met in 2001 and 2002 to define the objectives of the NAAHP. In 2003, the Federal Executive Committee of the task force approved the process. Drafting of the plan began in 2003, and it was scheduled for completion in 2006.

Since 2004, several working groups (WG) consisting of experts representing the aquaculture industries, States, Tribes, academia, Federal agencies and relevant stakeholders have been invited to meet to discuss aspects of the NAAHP. Eight working

(See NAAHP on page 8)

(TUBIFEX con't from page 1)

In laboratory experiments, lineage VI exhibited resistance to *M. cerebralis* infection at all three temperatures tested (5,17 and 27 deg. C.). Lineage III became infected at both 5 and 17 deg. C. These test results seem to confirm other studies that have shown a wide range of susceptibility among *T. tubifex* to *M. cerebralis* infection. Although survival of lineage VI was consistently higher at 17 deg. C, the effects of temperature on survival of the two lineages were not statistically significant. The researchers suggest further study of the effect of temperature on *T. tubifex* worms. Research suggested during this study that photoperiod did not appear to have any effects on survival and growth of the two lineages. The researchers also found that *T. tubifex* of lineage VI had greater weight gains and greater reproductive rates than lineage III. These results confirm studies that have shown a range of growth and reproductive rates among *T. tubifex* from different geographical populations. However, this the first report of differences in growth and reproduction between these two lineages.

The variations between *T. tubifex* lineages may be very important in whirling disease management and control. Other experiments have shown that the severity of whirling disease in juvenile rainbow trout was directly related to the production of triactinomyxons (TAMS) by *T. tubifex.* If some lineages of *T. tubifex* are resistant to infection by *M. cerebralis,* they might produce fewer TAMs and lessen the severity of whirling disease in fish. Other research has found that resistant *T. tubifex* lineage V from Hamil-

(Continued)

(TUBIFEX continued)

ton Bay in Ontario, Canada, actually ingested and deactivated *M. cerebralis* spores. This study suggests some resistant worms could possibly act as filters, deactivating *M. cerebralis* spores from the sediment and preventing their contact with less resistant lineages. This action could potentially lessen the severity of whirling disease in fish.

Their research revealed important differences between worm lineages and provided more information about this complex problem that could potentially be used in habitat or population manipulations as a management tool. In summary, varied lineages of *T. tubifex* may mean less severe impacts of whirling disease in some infected water bodies. It may also help account for the varied impacts observed from whirling disease. There may even be management techniques to exploit variations in *T. tubifex* to reduce the occurrence and severity of whirling disease.

(ORGANICS con't from page 6)

this list to determine which ones are necessary candidates for petitioning for listing. The NOAWG is working on this list now and plans to petition for necessary substances soon. As the IFR moves through the USDA system, future articles in the Fish Culture Section of the American Fisheries Society magazine will explain various aspects of the NOAWG proposal. Interested growers may wish to consider selecting certifiers soon and begin the mandated conversion period of one year under organic production. This can be done prior to the anticipated amend-

(See ORGANICS on page 8)

(NAAHP con't from page 7)

groups have met since 2004 with the following agendas:

WG 1: Roles & responsibilities of aquatic animal health professionals

WG 2: Diseases/ pathogens of regulatory significance and their surveillance

WG 3: Laboratory methodologies

WG 4: Salmonids: Pathogen/disease program standards

WG 5: Warmwater finfish pathogen/disease program standards

WG 6: Disease program standards for ornamental/tropical finfish

WG 7: Mollusk disease program standards

WG 8: Baitfish, cool water ornamentals and koi

WG 9: Crustacean pathogen/disease program standards

WG 10: Natural resources and conservation

WG 11: Research

In December 2006, the task force plans to meet with state veterinarians and state directors of conservation to seek their involvement in the process and endorsement in the NAAHP. National programs that are currently in use such as the National Poultry Improvement Program, may be evaluated for similarities to the NAAHP. The task force will also seek improvements in communication between state agriculture and natural resource agencies.

The NAAHP could be voluntarily implemented by states as a model in order to provide consistency. The NAAHP seeks to include historical health inspection data from producers, states, and federal agencies into a common da-

(Continued)

(ORGANICS con't from page 7)

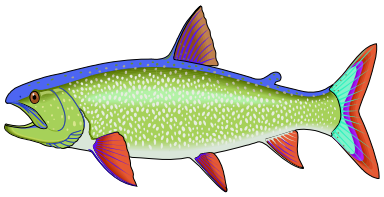
ments for aquaculture to the Final Rule before becoming effective and could allow qualified growers to begin labeling their organic aquaculture products soon after the amended Final Rule is effective.

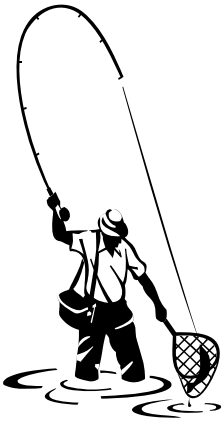
In the meantime, interested readers are encouraged to printout and carefully study the IFR in order to provide NOP with appropriate comments and support.

Information regarding organic aquaculture was supplied by mail to aquaculture facility owners in Utah last February from the UDAF Fish Health Program.

(NAAHP continued)

tabase. The NAAHP is a guidance document to develop strategies and provide guidance to protect US aquatic resources and commercial interests. The NAAHP states that the authority of states and tribes to regulate and manage resources within their jurisdictions remains recognized by the Federal government. The final draft of the NAAHP is slated to be approved by the JSA in 2007.





BOOTS CAN SPREAD WHIRLING DISEASE

Source: The Whirling Disease Initiative Newsletter, Volume 2, Issue 1, January 2006

Human activities have long been suspected as an important vector for spreading whirling disease. Preliminary results from a study conducted at Oregon State University showed that waders can be vectors to transport both the triactinomyxon (TAM) and myxospore life states of *Myxobolus cerebralis.* The study, which was slated to be completed in June 2006, is being conducted by Paul Reno and David Latremouille. This research has shown that the transport of TAMs and spores by human activity can cause infection in both rainbow trout and *Tubifex tubifex* worms. This study has so far demonstrated "the transport and infectivity of *M. cerebralis* on waders and wading boots." The above mentioned researchers are also investigating the viability of *M. cerebralis* after ingestion by several bird species. Results from that study are also forthcoming.